

Virtual Clinic Diagnosis Of Fractured Leads In A Spinal Cord Stimulator Patient Lacking Direct Physician Access - A Case Report

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INTRODUCTION

- Spinal cord stimulators (SCS) have become pivotal in chronic pain management.
- SCS have been established as a safe, reversible modality that effectively alleviates pain, enhances functional outcomes, and augments overall quality of life. However, approximately 30%-40% of patients with SCS can develop complications related to device failure or biological factors that require timely diagnosis and intervention (1). This poses a significant challenge for patients without immediate access to physician care.
- This abstract introduces a challenging case where virtual clinic software was employed to identify fractured leads, a well-documented hardware malfunction, in a patient with an SCS situated on another continent who did not have immediate access to face-to-face physician consultation.
- Utilizing a virtual platform similar to this case might offer a feasible solution to bridge the gap between remote patients with SCS and immediate diagnostic care, underscoring the potential for digital healthcare expansion in interventional pain management.

MATERIALS AND METHODS

- The patient was informed and consented in writing to be published in the case report. This case report is IRB-exempt based on Baylor College of Medicine policy. The patient was assessed and diagnosed using the first FDA-approved virtual clinic software for spinal cord stimulators developed by her spinal cord stimulator manufacturer (Abbott NeuroSphere™ Virtual Clinic) (2,3).

CASE REPORT

- A 63-year-old female with a past medical history of vasovagal syncope treated with a permanent pacemaker, cirrhosis, hypothyroidism, chronic immune thrombocytopenic purpura, anxiety, depression, fibromyalgia, and chronic thoracic and cervical pain status post-implantation of cervical and thoracic SCS for one year contacted her SCS representative in Houston, Texas from her location in South Asia due to an exacerbation of her thoracic spine pain.
- The patient reported that her current pain was similar to the pain previously mitigated by her SCS. At the time, since the patient was overseas and she lacked immediate access to her pain physician. Utilizing the virtual clinic platform provided by her SCS manufacturer, an assessment report was generated and revealed potential malfunctioning of her SCS, likely attributed to lead fractures (Figure 1).
- Consequently, she was advised to return to the United States for a comprehensive SCS revision. Following her return, the suspected fractured leads were re-confirmed through an in-person evaluation utilizing an instrument provided by her SCS manufacturer. The fractured leads were subsequently extracted and replaced by her pain physician. After the procedure, the patient's SCS functionality was restored, significantly ameliorating her pain symptoms.

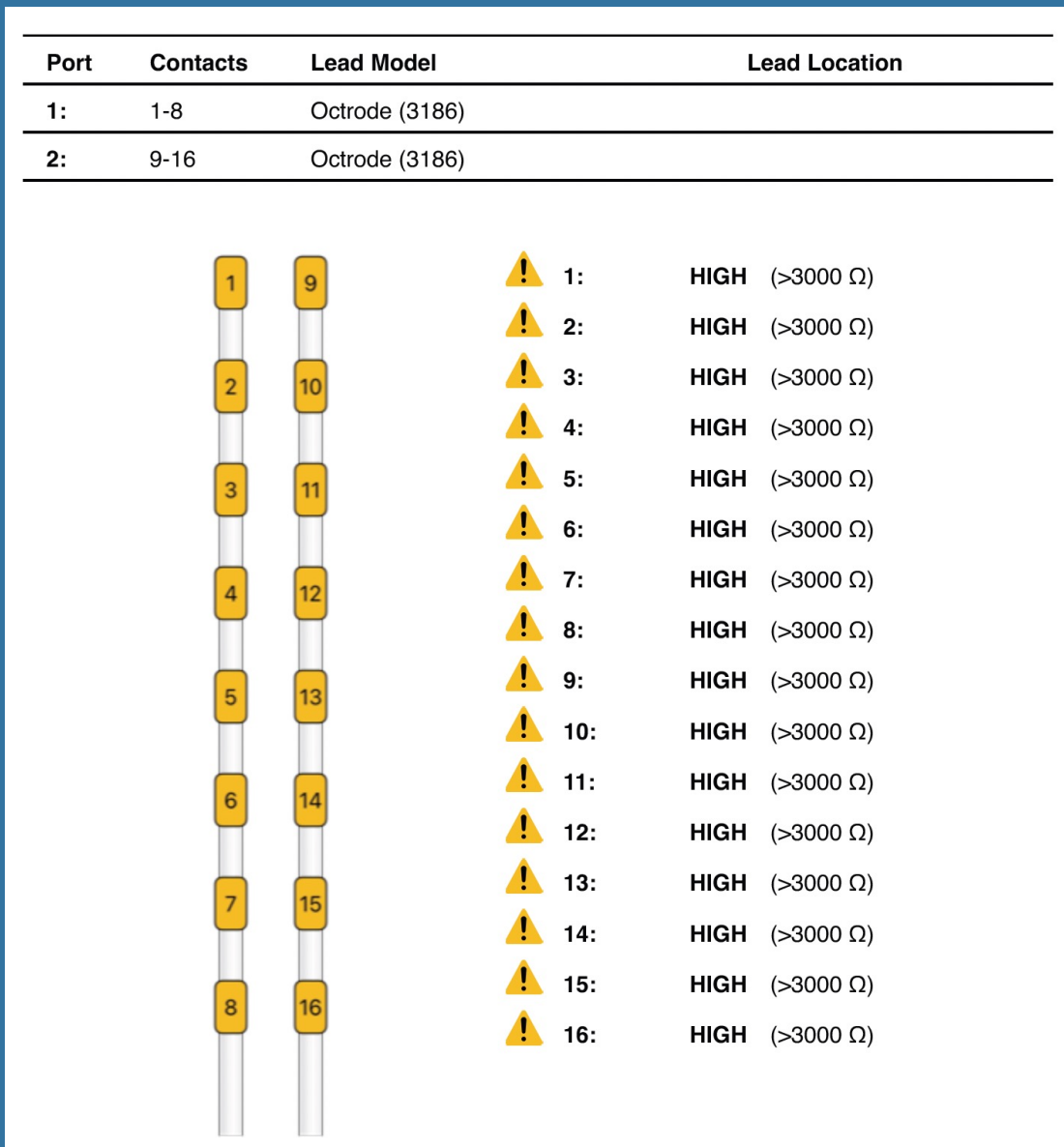


Figure 1. The report of patient leads generated via the patient's SCS manufacturer's virtual clinic platform showed the two leads were not working correctly due to lead fracture.

DISCUSSION

- Even though the introduction of SCS marked a significant advancement in chronic pain management regarding safety and efficacy, patients with SCS implantation can be at risk for complications stemming from device failures or biological factors. Lead migration is the most common complication of all possible SCS-related adverse events (1). Lead fracture or disconnection happened in 5.9%–9.1% of the cases related to device failure (4). These complications usually require timely diagnosis and intervention. However, geographical constraints can impede such access. According to a recent study, patients with SCS have a high demand for remote follow-up and remote programming due to its cost and time efficiency (5). This presented case underscores the potential efficacy and convenience of leveraging virtual healthcare platforms for SCS management, particularly in diagnosing hardware complications such as fractured leads.
- The utilization of the pioneering virtual platform mentioned in this case report exemplifies how digital innovations can potentially revolutionize patient care in interventional pain management. For our patient, despite being overseas, the virtual clinic facilitated an accurate diagnosis and subsequently guided her to seek immediate intervention. This remote diagnostic capability not only ensures the continuity of care but also minimizes the delay in addressing other potential complications, hence averting further aggravation of pain or device malfunction. To our knowledge, this case report is the first case that utilized a specialized virtual clinic platform to diagnose SCS malfunction.
- While this singular case demonstrates the promise of virtual clinic platforms in managing SCS-related issues, broader studies are essential to validate its widespread efficacy, reliability, and safety. It would be imperative to evaluate factors such as diagnostic accuracy, data security, patient satisfaction, and overall clinical outcomes associated with such platforms.
- As the realm of digital healthcare evolves, the integration of virtual clinics, especially in niche sectors like SCS implantation, could be pivotal in advancing the field of interventional pain management. Such platforms can also enhance overall patient outcomes by bridging geographical and logistical barriers. This is especially relevant to border states such as Texas and institutions such as Baylor College of Medicine that see many international patients from Latin America.

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